



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,658	02/07/2002	Tomoyuki Furuhashi	9319S-000328	3300

27572 7590 12/04/2003

HARNES, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

PIZARRO CRESPO, MARCOS D

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,658

Applicant(s)

FURUHATA ET AL.

Examiner

Marcos D. Pizarro-Crespo

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-11 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-11 and 19-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Application/Control Number: 10/072,658 (Final Rejection)
Art Unit: 2814

Page 2

Attorney's Docket Number: 9319S-000328

Filing Date: 2/7/2002

Claimed Foreign Priority Date: 1/30/2002 (JP 2002-21025)
2/8/2001 (JP 2001-32069)

Applicant(s): Furuhashi et al.

Examiner: Marcos D. Pizarro-Crespo

DETAILED ACTION

This Office action responds to the amendment filed on 9/22/2003.

Acknowledgment

1. The amendment filed on 9/22/2003 in response to the Office action mailed on 6/19/2003 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-11 and 19-21.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Initially, and with respect to claim 11, note that a "product by process" claim is directed to the product *per se*, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which makes it clear that it is the final product *per se* which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re*

Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).

Note that Applicant has burden of proof in such cases, as the above case law makes clear.

7. Claims 8 and 11 are rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Fujii (US 5077238).

8. Regarding claim 8, Fujii shows (see, e.g., fig. 4G) all aspects of the instant invention including a semiconductor device having a non-volatile memory transistor formed on a semiconductor layer, the semiconductor device comprising:

- ✓ an interlayer dielectric layer provided over the semiconductor layer **1** and the transistor with the interlayer dielectric layer being in direct contact with a component of the transistor
- ✓ a wiring layer **13** on the interlayer dielectric layer

wherein the interlayer dielectric layer includes an oxide film **27** as the lowermost layer and a layer **20** containing nitride on the oxide film **27**.

9. Regarding claim 11, Fujii shows that the interlayer dielectric layer includes an oxide film **27** as the lowermost layer (see, e.g., fig. 4G).

As to the grounds of rejection under section 103(a), the method of forming the oxide film by reduced pressure CVD using TEOS, is an intermediate process step that does not affect the structure of the final device. See MPEP § 2113, which discusses the handling of "product by process" claims and recommends the alternative (§ 102 / § 103) grounds of rejection.

10. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii and Wu (US 6008517).

11. Regarding claims 9 and 10, Fujii shows most aspects of the instant invention (see paragraphs 8 and 9 above), except for the oxide film having a thickness of 30-70 nm.

In spite of Fujii not showing that the oxide film has a thickness of 30-70 nm, since the applicants have not established the criticality (see next paragraph) of the film thickness and since these thicknesses are in common use in similar devices in the art (see, e.g., Wu/col.4/ll.16), it would have been obvious to one of ordinary skill in the art to use these values in the device of Fujii.

CRITICALITY

The specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (AAPA) in view of Fujii.

13. Regarding claim 19, AAPA shows (see, e.g., fig. 18) most aspects of the instant invention including a semiconductor device having a non-volatile memory transistor formed on a semiconductor layer, the device comprising:

- ✓ an interlayer dielectric layer **240** over the semiconductor layer **10** and the transistor, the transistor having a split gate structure

wherein the interlayer **240** includes an oxide film (see, e.g., pp.2/ll.4). AAPA, however, fails to show a layer containing nitride on the oxide film. Fujii (see, e.g., col.8/ll.30), on

the other hand, teaches that forming such a nitride layer over AAPA's oxide film will clean out the surface of the oxide film of any traces of water and acid.

It would have been obvious at the time of the invention to one of ordinary skill in the art to form a nitride-containing layer over AAPA's oxide film, as suggested by Fujii, to clean out the surface of the oxide film of traces of water and acid.

14. Claims 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by a Kim (GB 2305295).

15. Regarding claim 20, Kim shows (see, e.g., fig. 2) most aspects of the instant invention including a semiconductor device having a non-volatile memory transistor formed on a semiconductor layer, the device comprising:

- ✓ an interlayer dielectric layer over the semiconductor layer **101** and the transistor **109**

wherein the interlayer dielectric layer includes an oxide film layer **121** and a layer containing nitride (see, e.g., pp.8/ll.10-15) on the oxide film, and wherein the oxide film has a thickness of 10-80 nm (see, e.g., pp.6/ll.17).

16. Regarding claim 21, Kim shows (see, e.g., pp.6/ll.17) that the oxide film may have a thickness of 30-70 nm.

Response to Arguments

17. Applicant's arguments with respect to claims 8-11 and 19-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

20. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

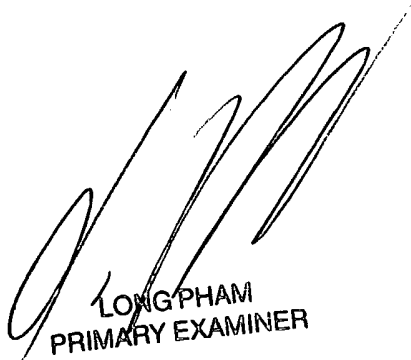
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(703) 308-6558** and between the hours of 9:30 AM to 8:00 PM (Eastern Standard Time) Monday through

Thursday or by e-mail via Marcos.Pizarro@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

22. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

23. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/632-651,758-760	11/18/2003
Other Documentation: PLUS Analysis	6/5/2003
Electronic Database(s): EAST (USPAT, EPO, JPO, PGPub)	11/18/2003



LONG PHAM
PRIMARY EXAMINER

Marcos D. Pizarro-Crespo
Patent Examiner
Art Unit 2814
703-308-6558
marcos.pizarro@uspto.gov